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ABSTRACT
The Gilroy, California, Unified School District contracted with Westinghouse Learning Corporation for the 1970-71 school year for the purpose of improving reading and mathematics achievement of approximately 100 Spanish-surnamed boys and girls from grades 2-4. The average gain at the end of the program was 0.6 achievement years in reading and 0.8 achievement years in mathematics, well below the expected two-year gain. An analysis of nonacademic results, however, revealed that: (1) Students generally enjoyed the program; (2) There was no observable effect of the program on student attendance; (3) 48 out of 53 parents indicated their approval of the program. The author indicates performance contracting acted as an agent for positive change. Teachers are more concerned with diagnosing a child's performance in relation to the skills he needs to develop, and then prescribing for him an instructional curriculum that is specific to his individual needs. For related documents, see ED 056 247, 248, 249, 250, and 252. (Author/CK)

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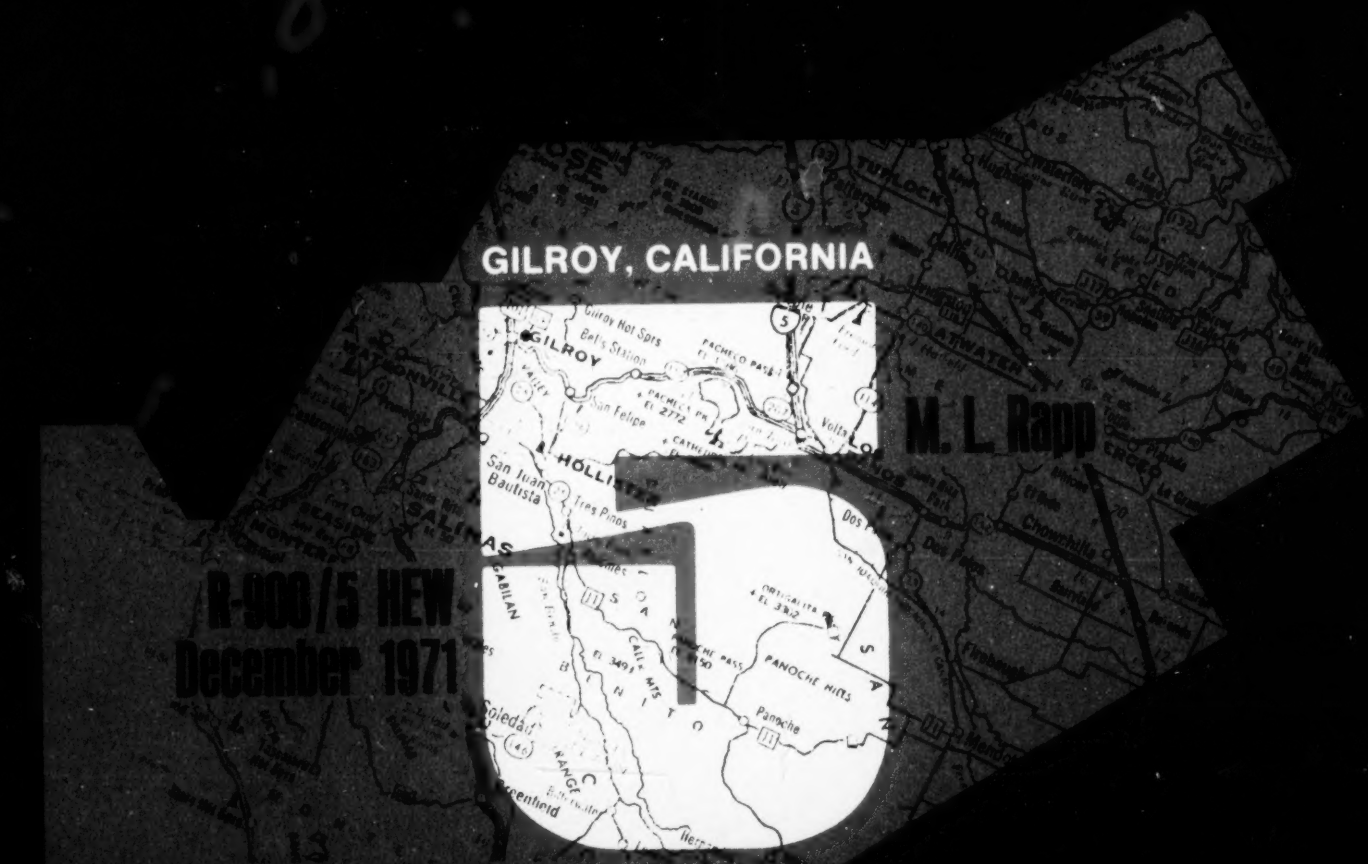

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CASE STUDIES IN EDUCATIONAL PERFORMANCE CONTRACTING

M. L. Rapp

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GILROY, CALIFORNIA

Prepared for the Department of Health, Education, and Welfare

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PREFACE

This Report is a product of Rand's study of performance contracting in education. The study is sponsored by the Assistant Secretary for Planning and Evaluation, U.S. Department of Health, Education and Welfare, under Contract No. HEW-OS-70-156.

Case Studies in Educational Performance Contracting comprises six volumes. Each is a self-contained study; together they provide a multifaceted view of performance contracting. The six volumes are:

1. R-900/1-HEW, *Conclusions and Implications,* by P. Carpenter and G. R. Hall
2. R-900/2-HEW, *Norfolk, Virginia,* by P. Carpenter
3. R-900/3-HEW, *Texarkana, Arkansas and Liberty-Eylau, Texas,* by P. Carpenter, A. W. Chalfant, and G. R. Hall
4. R-900/4-HEW, *Gary, Indiana,* by G. R. Hall and M. L. Rapp
5. R-900/5-HEW, *Gilroy, California,* by M. L. Rapp and G. R. Hall
6. R-900/6-HEW, *Grand Rapids, Michigan,* by G. C. Sumner

This study is the second of three Rand Reports on the subject. The first Report was J. P. Stucker and G. R. Hall, *The Performance Contracting Concept in Education,* The Rand Corporation, R-699/1-HEW, May 1971. The third Report will be a performance contracting guide intended for use by educational officials.

SUMMARY

The Gilroy, California, Unified School District contracted with Westinghouse Learning Corporation for the 1970-71 school year, in hopes of improving the reading and mathematics achievement of approximately 100 Title I students, most of whom tested below grade level at the start of the program. The students were mostly Spanish-surnamed boys and girls, from grades 2, 3, and 4.

As to be expected, a number of problems arose during the year that had to be resolved for the program to continue. These problems arose largely for two reasons. First, WLC did not have a completely developed curriculum, nor was WLC prepared for the very low entering achievement level of some of the students, especially in the second grade. Second, problems arose because the staff of the district had not been sufficiently involved in making the decision to implement a performance contract. This was especially true of those teachers in Eliot School who were not directly involved in the program, but whose students attended the center for their instruction in reading and mathematics. There was a cooperative spirit between the program teachers and the Westinghouse on-site director which enabled each to take advantage of the other's expertise in improving the program as it progressed during the year.

Achievement results did not come close to the expectations of either the school district or the contractor. Gilroy had hoped for two achievement-years of gain for each student in both reading and mathematics during the school year. Instead, the

average gain was 0.6 achievement-years in reading and 0.8 achievement-years in mathematics.

An unusual feature of the Gilroy program was that some students took both the Metropolitan Achievement Test and the Stanford Achievement Test on a pre- and post-test basis. This feature provided both a "backup" test and also an alternative measure of cognitive growth. There was no significant difference between mean achievement gains as measured by the two instruments.

An analysis of nonacademic results revealed that: (1) students who were interviewed generally enjoyed the program, (2) there was no observable effect of the program on student attendance, and (3) of the 53 parents who returned a questionnaire eliciting their opinion of the program, 48 were pleased with it.

Despite the disappointing achievement, performance contracting acted as an agent for positive change. The staff of Eliot School, including the teachers who were not involved in the program this year, have submitted a proposal to the Superintendent to run their own reading resource center at the school next year. They found the systematic approach taken by Westinghouse a model around which they could organize their efforts for changing pupil behavior. The teachers are more concerned today with diagnosing a child's performance in relation to the skills he needs to develop, and then prescribing for him an instructional curriculum that is specific to his individual needs. Because there were two instructional aides in the center, and because the program was individualized, the teacher's role changed from that of being the traditional imparter of information to acting as a manager of learning experiences.

ACKNOWLEDGMENTS

We thank our Rand colleagues G. H. Fisher, S. A. Haggart, and S. H. Landa for their help and contributions.

We gratefully acknowledge the cooperation of the staff of the Gilroy Unified School District, who gave generously of their time and supplied the information that made this report possible. We are particularly indebted to Dr. Robert Infelise, Superintendent, Mr. Rodney T. Kelley, Director of Elementary Instruction, Mr. Dave Downing, Director of Special Projects, and Mr. Robert Medley, Principal of Eliot School.

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I. INTRODUCTION

This Report analyzes the performance contracting experience of the Gilroy (California) Unified School District (GUSD) during 1970-71 and its implications for other school districts considering performance contracts. Gilroy's experience is instructive. GUSD serves sizable Mexican-American and migrant worker communities and has challenging compensatory education responsibilities. Like many other school districts, it is small and has more limited curriculum development resources and other support services at its disposal than those enjoyed by larger school districts. The performance contracting program that Gilroy sponsored was a "barebones" model lacking many of the features of larger programs, such as competitive source selections, management support contractors, independent evaluation contracts, and so forth. The very austerity of the program offers some interesting advantages to the researcher, however. Gilroy permits examination of a very straightforward approach to performance contracting, as well as the contribution of one performance contract to compensatory education in a smaller school district.

Section II gives some background details about Gilroy. Sections III and IV describe the program. Section V analyzes the academic achievement outcomes of the program, and Section VI discusses other aspects of the program. The final section presents some conclusions.

II. GILROY, CALIFORNIA

Gilroy, California, is in the southern Santa Clara Valley (see Fig. 1). Its population was 11,250 in the April 1970 census. Approximately 34 percent have Spanish surnames. U.S. 101 and the Southern Pacific railroad run through the center of town. To the east there is a heavy concentration of Spanish-surnamed families. To the west the city is largely Anglo. The performance contracting program that is the subject of this study was located at Eliot School east of the tracks (see Fig. 2).

The Gilroy area is predominantly agricultural but because of its proximity to San Jose, 35 miles to the north, there is increasing occupational diversification. San Jose is the home of a large division of Lockheed, IBM has offices there, and much light electronic manufacturing has come to the San Jose area in the wake of these corporations.

Gilroy Unified School District has a student population of approximately 5000, from kindergarten through the twelfth grade. Approximately 54 percent of the students come from families whose annual income is less than $3000. Approximately 21 percent of the Spanish-surnamed population are receiving assistance under the Aid to Families with Dependent Children program.

The GUSD is headed by an elected school board that is very active in school policy formation. Two board members are Mexican-Americans. The board approved the performance contracting program on an experimental basis, but as will be discussed later, the initial impetus for the program came from the school administration.

Fig. 1—Location of Gilroy, California

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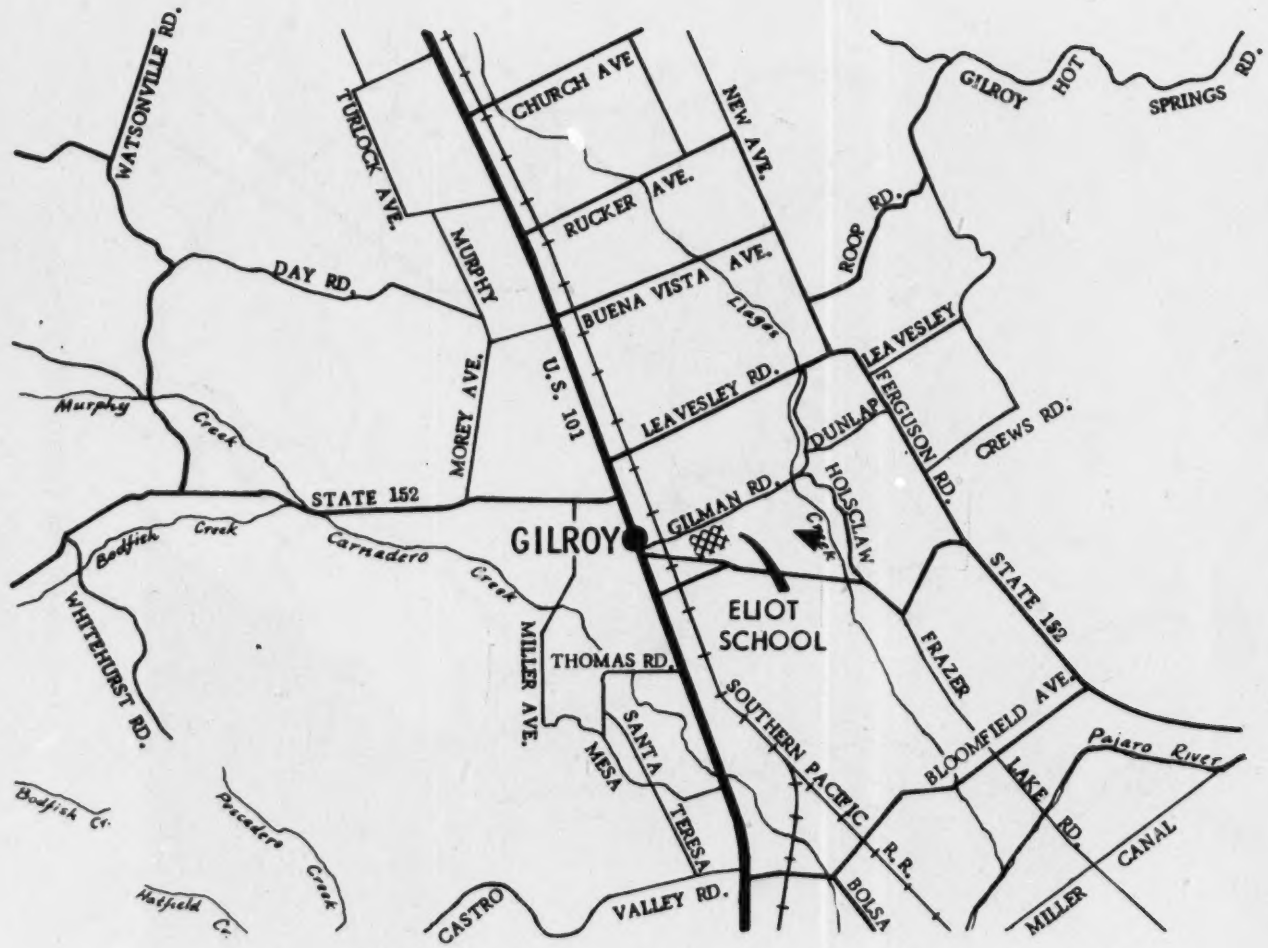

Fig. 2—Location of Eliot School, Gilroy

There is a strong teachers union in Gilroy that is an active commentator on school district affairs. Despite national union opposition to performance contracting, the local union was persuaded to accept the performance contracting program on a trial basis. The local PTAs are weak and were not much of a factor in the program.

GUSD has striven with some success to raise the achievement scores of its students, but achievement scores in general and at Eliot School in particular are below national averages. For example, the district mean on the word-meaning section of the Stanford Achievement Test at the end of the eighth month of instruction in the fourth grade (when students should have scored 4.8) was 3.6 in 1967, 4.0 in 1968, and 4.4 in 1969. The scores for Eliot School for those three years were, respectively, 3.7, 3.9, 3.9. For the Spanish-speaking population of Eliot they were 3.2, 3.7, and 3.7. In 1969-70 about 70 percent of the Eliot students did not make a year's gain for a year's instruction in reading or mathematics.

There has been a district-wide upgrading of skills. In reading, for all Title I schools in Gilroy in 1970, the second grade gained 5 months for 7 months instruction, the third grade 7 months for 7 months instruction, and the fourth grade 3 months. In 1971 in all Title I schools, the gain in the second grade was 7 months in 7, in the third grade 4 months in 7, and in the fourth grade 3 months in 7. Thus, while the upward trend in achievement gain was sustained in the second grade this year, the third grade made less gain and the fourth grade showed the same gains as for 1970.

In short, despite an upward trend in educational effectiveness as measured by standardized achievement tests, Gilroy students, and particularly the Spanish-surname students, typically test below national norms. GUSD officials have aggressively sought new programs to deal with this problem. In 1970 they experimented with performance contracting to see if it would solve Gilroy's compensatory education problem.

III. THE GILROY WESTINGHOUSE LEARNING CORPORATION PROGRAM

DEVELOPMENT OF THE PROGRAM

Many performance contracting programs have involved need-assessment studies, development of Requests for Proposals (RFPs), and other extensive planning activities. The Gilroy program stands in sharp contrast. The development of the program was simple, in part reflecting the style of the GUSD Superintendent, Dr. Robert Infelise. Infelise is a young activist and relatively new to the district. As he explained to the Rand researchers, he is inclined to get things going and worry later about details.

Gilroy's entrance into performance contracting reflects this approach. Infelise was on a personnel recruiting trip to Albuquerque, New Mexico, when he first heard of performance contracting. Albuquerque was the headquarters of the Westinghouse Learning Corporation (WLC), and someone suggested that Infelise observe its activities. WLC was at that time considering a number of possible performance contracting programs; as it turned out, it had five programs in operation during 1970-71. Infelise visited WLC and discussed performance contracting with WLC Director Kenneth M. Kamerman. He shortly broke off the discussion with the statement, "Let's not talk generalities, come to Gilroy and bid on a program." Westinghouse and GUSD jointly worked out a program that was approved by the Gilroy School Board and embodied in a contract signed July 9, 1970 (see Appendix).

Two points about the program's conception are worthy of emphasis. First, as Infelise made clear to Rand, he initially viewed the program as simply a remedial education effort. He is strongly committed to increasing the level of achievement scores in Gilroy; WLC asserted that it could provide a "catch-up" program and Infelise was willing to let it try. The use of performance contracting as an education change mechanism, or as a way of introducing accountability, or to achieve other goals that have played a part in other performance contracting programs, did not operate in Gilroy at the start. In Infelise's eyes the only goal was to produce a big jump in Title I achievement scores. This point is important because given this conception, GUSD was less concerned than many other cities were with evaluations, teacher training, and other such ancillary activities. The point is also important because, as will be explained later, the program may turn out to have had some unintended but salutary curriculum benefits apart from compensatory education.

The second point about the conception of the contract is that for both parties it was a launch into the unknown. WLC had not dealt with performance contracts before 1970-71; little of its past work had dealt with Spanish-speaking children; the program was a very small one—103 students—and the economics of small performance contracting programs were not well understood. For GUSD performance contracting was new. Of course, few school districts in the summer of 1970 knew much about the concept besides what they had heard about the 1969-70 program in Texarkana. However, Gilroy had hit upon the idea of the performance contracting program late in the 1969-70 school year, wanted to implement it for the fall of 1970, and so had moved fast. The result was that the planning and structuring of the program became a joint and iterative process of exchanging proposals and counterproposals between the two sides until an agreement could be reached. More important, many aspects of the program were left undefined. Throughout the year, many basic issues arose and had to be resolved in midstream.

THE PROGRAM

GUSD budgeted the program for $60,000, of which $48,000 came from Title I funds and the rest from the regular school district accounts. As the program was developed the contract itself became the major program document. Table 1 summarizes some of the major features of the program.

Table 1

PROGRAM AND RESOURCE INFORMATION

Characteristics of students.....	Grades 2-4; Title I; low socioeconomic status
Program scope	
Class time.....	1.25 reading, 1.25 math
Class size.....	50 students per class
Number of sections.....	2
Utilization.....	5 hours a day
Number of students.....	103
Facilities	
Space.....	2000 sq ft; 1 classroom, 1 activity area
Furnishings.....	6 carrels, carpeting, tables
Staffing	
Special teachers.....	1 full-time-equivalent reading specialist
Paraprofessionals.....	2 per center, 1 per activity area
Equipment.....	Telex, tape recorders, cassette players, headset
Materials.....	Books, games, toys
Pre-service training.....	4 days
In-service training.....	1 week, total
Other support.....	Remote diagnostic and prescriptive
Incentives.....	25 per student--candy, scrip

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The contract as written called for instruction in two subjects, reading and mathematics. The objective was simple: 400 achievement-years of gain—200 in reading and 200 in math, or any combination thereof.

The contract covered 103 students in grades 1 through 4. Since the target group consisted of all Title I students in Eliot School, elaborate selection criteria were unnecessary.

The contract called for the students to be tested at the beginning of the program and assigned an "objective gain" (a concept that will be explained later). When WLC believed the student had achieved the specified gain, the student was to be retested with another form of the test, and if he had reached his objectives he was to be returned to his regular class. If he had not made the required score on the post-test, he was to continue in the program.

If a student made less than one year's gain between pre- and post-tests in a subject, no payment was to be made for that student. The upper limit of payment liability was set by the program objective gain determined by WLC individually for each student after the pre-testing and diagnostic testing had taken place at the beginning of the school year.[1] That is, it was not to cost the school still more if a student surpassed his assigned objective gain. Although the goal of the program was 400 achievement-years, the agreement stipulated that Gilroy would enroll enough students to provide WLC an opportunity to obtain total objective gains of at least 355 achievement-years. A clause in the contract also specified that the achievement-year would be gained in 90 hours of instruction or less. If the average time were greater than 90 hours, the price would be reduced proportionately. The contract states, "the objectives of the program are that all students enrolled in it will (a) advance at least one grade level in reading and math at the end of fiscal year 1971, and (b) will further progress to performance level at or near the grade level at which they are enrolled in school." This implies average objective gains greater than one year in each subject.

The significance of the requirement that enough students be enrolled to permit WLC to achieve a potential outcome of at least 355 achievement-years can be seen by recalling that the price per achievement-year was $168.75. Multiplying 168.75 by 355 yields $59,906.25, compared to a budget for the project of $60,000.00. The figure of $168.75 was based on analysis by WLC and GUSD of the expected costs of the project.

[1] For more discussion of the WLC gain objective system, see Vol. 6 of this series, dealing with Grand Rapids, Michigan.

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When the program was implemented two major changes were made. First, the program was limited to grades 2 through 4. Enrollment was sufficient in these grades to provide 103 students. Also, though nobody ever said so explicitly, elimination of the first grade simplified the problem of obtaining usable pre-test scores.

The second major change was elimination of the variable exit-time feature. The students all remained in the program throughout the year. This change avoided the scheduling difficulties of returning students to regular courses at varying times, and avoided the question of how to find replacements for those who left. It also avoided the problems connected with the almost continuous testing program that would have been required if the contract had been carried out to the letter.

WLC agreed to provide the school with a detailed description of the space and furnishings required and to assign a manager from its staff. WLC also agreed to employ one or more aides in the center and to provide all training required for teachers and aides working in the program. WLC agreed to furnish all educational equipment and all educational and motivational materials required for use in the program, these to remain the property of WLC.

GUSD agreed to make suitable space available for a Learning Center to accommodate up to 52 students at a time. It additionally agreed to made adequate office space available for the use of the WLC staff manager and his secretary, and to provide all furniture for the Center and for the manager's office. GUSD further agreed to select two teachers from its staff to work in the Learning Center, and gave WLC the opportunity to participate in and approve of their selection. The selected teachers were to be available for training at least two weeks before the start of the school year.

WLC agreed that the program would be ready to enroll students by September 28, 1970, and the Center was to be opened and the program available to students at least 5 hours a day, 5 days a week during the school year. WLC agreed to accept for enrollment all students assigned to it by the school. WLC was to establish a learning objective and a program of study for each student, based on test information provided by the school. It reserved the right to notify the school within the first 20 hours of any student's attendance at the Center if it did not feel that the student could benefit from the program, and if, after review, GUSD concurred, the student was to be withdrawn from the program. WLC anticipated that not more than 3 percent of the students would fall into this category. WLC further agreed to arrange in cooperation with the school for visitors, observers, orientation sessions, and teacher workshops. It further agreed to provide the school with appropriate information on the progress of each student enrolled in the program.

The school agreed that in order to support the operation of the program it would select Title I participants according to their need for remedial instruction in mathematics and reading. GUSD agreed to pre-test each student to establish his entry level, using a nationally standardized test that reports in grade-level equivalents. It agreed to enroll enough students to supply a potential total of not less than 355 achievement-years in the Learning Center, and to arrange for 103 Title I students to attend the Learning Center for 2-1/2 hours every school day. GUSD further assured a "standard minimum attendance" in the Learning Center of at least 220 student-hours on at least 170 school days during this school year.

The GUSD Director of Elementary Instruction, Mr. Rodney T. Kelley, had primary cognizance of the program as part of his regular duties. Superintendent Infelise took a deep personal interest in the program. No GUSD administrator was assigned full time to the project, however, nor was any management support contractor or outside consultant involved. The basic philosophy, as explained by Infelise and Kelley, was that a very general agreement had been made between GUSD and WLC. Problems were expected to arise, but GUSD believed that good will on both sides would permit resolution on an ad hoc basis.

EVALUATION

Evaluation plans for the project developed gradually and informally. In the summer of 1970, when Rand asked Gilroy officials about their evaluation plans, they took the position that the evaluation would fall out of the operation of the program. A norm-referenced achievement test to be used for achievement measurement was to be selected and administered by GUSD. Infelise explained that WLC had accepted a goal of 400 achievement-years, and he felt that the only evaluation needed was to compare the actual test results against the 400 figure. He was quick to add, however, that a psychologist intern who was working in the district planned to do an evaluation of the program as his master's thesis, and another district employee was planning to use some of the program data in a doctoral thesis. Infelise also believed that Rand's studies in the district would contribute to the data base that would be available to him for an overall assessment of the program.

Thus, the evaluation was a relatively informal, intradistrict affair, but considerable evaluation data were generated. In order to maintain continuity in their testing program, and to compare achievement gains made in the Learning Center with

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those made in other Title I programs, the district administered both the Stanford Achievement Test, which was to be the basis for payment, and the Metropolitan Achievement Test, which Gilroy has used for some years in evaluating Title I programs. For some of the children in the program, then, two sets of pre- and post-test data were available. The MAT data provided a check on the program results as measured by the SAT data. The consistency of the two measurement instruments is an interesting matter, since a recurring question about performance contracting is whether choice of a test makes a difference in apparent achievement gains. The Gilroy experience provides some evidence on this point and will be discussed later. The MAT data also permitted Rand to compare the WLC students with other Gilroy students.

Various Gilroy school officials took an interest in assessing the results and impacts of the program. Several surveys were administered and, at the suggestion of Rand, the school psychologist administered the Gray Oral Reading Test (GORT) to some of the students in the program. Attendance data were collected, and Rand conducted a number of interviews with project personnel. Thus, owing to various people's interest in the project, a considerable amount of data on program results was collected. In future programs, however, it seems unlikely that so much data will be produced adventitiously. If a school district wants to examine the broad effects of a performance contracting program, it will be prudent to plan from the start for an evaluation.

It should be emphasized that Gilroy differed from most programs in having two sets of standardized achievement test data as well as the GORT data. Administering two norm-referenced tests has the drawback that it takes time from the operation of a program and it increases the possibility of overtesting. Nonetheless, it has great merit. The pre- and post-test MAT data forearmed Gilroy with a way to confirm or deny a charge of teaching-to-the-test had such a charge arisen (which it did not). Also, administration of the MAT test even though the SAT was used for payment purposes means that the district's longitudinal achievement-data series was not broken. Finally, and most important, administration of the MAT permits comparison of the achievements of students in the WLC and in other Gilroy programs.

IV. THE PROGRAM IN OPERATION

Two GUSD teachers worked in the Center, each on a half-time basis. The teachers were what in California are called "Miller-Unruh" teachers, trained reading specialists who qualify to conduct special State-financed compensatory education program classes. GUSD also supplied support services from both building and district administration. WLC furnished all instructional materials and equipment, and conducted 30 hours of in-service training in September 1970 for the teachers and aides who were to participate in the program.

The WLC Center began operating in the fall of 1970 with approximately 50 students in the morning for 2-1/2 hours, and 50 in the afternoon for 2-1/2 hours. Each session had a teacher and two instructional aides. In previous WLC experiences—notably at the Center they ran in Albuquerque, which students paid to attend and normally came to after school—WLC had found that a higher staff-to-student ratio was necessary during start-up of the system than later on in the program. This was largely because students needed to learn both how the system operated and how to manage their own learning experiences. Despite this past experience, the program at Gilroy did not provide for additional personnel during the first weeks of operation, and as will be discussed later, this was unfortunate because some problems might have been avoided. The basic problem was that students needed to learn how the system operated. They were in an unfamiliar environment where they were expected to work independently. Because of their need for advice and guidance, there were often long queues of children waiting for instruc-

tion. Teachers felt that students became frustrated by having to wait for a long time to have a lesson corrected or to receive a new assignment. The problem was exacerbated for second-graders, who needed constant direction of their learning activities. The addition of one or two aides for a few weeks would have facilitated a smoother transition from a traditional setting to the modus operandi of the Learning Center. After about a month of operation, a third aide was assigned to the program so that two could help the teacher in the classroom and one could run the reinforcement center.

FACILITIES

GUSD made two rooms at Eliot School available to WLC: a large classroom facility and a room called the reinforcement center. Both were furnished according to specifications laid out by WLC.

Eliot School is a Spanish-style building, well maintained and attractive, but several decades old. It has a central chamber onto which the school office and several classrooms open. The reinforcement center was constructed by partitioning the central chamber. The WLC classroom opened off the chamber and was next to the school office. The WLC manager and his secretary shared the office with the principal, school secretaries, and a Telex machine that linked Gilroy with WLC's Albuquerque computer. The diagnostic work was done remotely by means of the Telex link.

This was the best physical arrangement possible at Eliot without extensive structure modifications, but the facilities were not well suited to the WLC program. The basic problem was that they were too small. Center personnel had to deal with many problems due to overcrowding in the reinforcement center. For example, in November 1970 the children were complaining about losing time in the reinforcement center that they had earned. The original plan was for all children to start off in the Learning Center and remain there until they began to earn time in the reinforcement center. This meant that the reinforcement center became very crowded toward the end of the instructional period. Children who earned their "fun time" too late might not be able to get into the center.

One response to this situation would have been to let students carry over their reinforcement center "credits" until the next morning. WLC resisted this on the grounds that it would create too large a gap between the response and reinforcer.

Another obvious response would have been to reschedule students. Center personnel suggested that instead of 50 students involved for 2-1/2 hours in the morning and 50 for 2-1/2 hours in the afternoon, the group be split into four equal sessions.

The Eliot teachers not involved in the program resisted this suggestion, however. They argued that the program had already caused substantial changes in their schedules and had disrupted their programs. Further disruption would be unfair to them and to the rest of the Eliot program. As a result, the original schedule was maintained until Easter, and the high noise level and other undesirable effects of the lack of space were accepted. At Easter, for reasons to be discussed later, there was a change in thinking on the part of the Eliot faculty and the reorganization into four groups took place. Facilities problems were greatly lessened. Nonetheless, the conventional California school building built in the 1930's and 1940's is not well adapted to the type of program WLC conducted, and this was a handicap during most of the year.

CURRICULUM AND EDUCATIONAL PROCESSES

WLC built the curriculum for its Centers by discussing with several school systems the textbook series generally adopted for classroom use in reading and mathematics. These series were then analyzed for identification of academic skills, the grade level at which these skills were introduced, and the development of the skill from its initial teaching to its more complex form.

The instructional materials were selected by three criteria: (1) they should be self-instructional; (2) they should be usable on an individual learner-paced basis; (3) they should teach the skills identified in WLC's curriculum analysis. The materials selected included programmed instruction workbooks, audio tapes, film strips, and like materials.

A student enrolled in a WLC Center took a standardized achievement test in reading and mathematics, and at the end of the program took an alternate form of the test. The gain between the two administrations of the test was used as the basis for payment of that student's achievement gain. Another purpose of the pre-test, however, was to give WLC an insight into where to start diagnostic testing for an individual student in order to determine his skill strengths and deficiencies. The results of the diagnostic tests were put on the Telex and sent to Albuquerque, where they were used to select instructional sequences that WLC felt would best meet the

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student's needs. An instructional sequence designed to teach a specific skill was often a combination of portions of available materials, and might employ several media.

An instructional sequence was agreed upon by each student in consultation with the teacher. This took the form of a "contract" for the student's next unit of work. The Center sought to identify points of difficulty before a student lost much instructional time. The staff suggested more appropriate ways of reaching any particular student having difficulty. Each student experienced early and repeated success—an experience many of them had rarely enjoyed in a school setting.

The WLC educational approach made considerable use of extrinsic incentives. In the Gilroy program two basic uses were made of this kind of motivational management. First, when a student successfully completed his contract, he was allowed a specific amount of time in the reinforcement room or, as it was also called, the activities area. In this part of the Center, students were allowed to engage in activities different from the instructional activities that were taking place in the classroom. There were books and toys, including a small pool table.

The second incentive was scrip money the students earned by completing a series of instructional sequences. The WLC on-site manager arranged with several of the merchants in town to accept scrip for hamburgers, milkshakes, movies, and some more material items from the local variety store and other shops.

The rationale behind this kind of motivational management, as expressed, *inter alia,* in WLC publications, is that it will help a student to assume control over his own learning. In theory, this system generates a gradual shift from the usual classroom situation with maximum control of a student's instructional activity by a teacher, to minimum control by the teacher and maximum control by the student. The student is supposed to learn to verify his own progress by the test he takes after completing an instructional sequence, and learn the procedure to follow once a sequence has been completed so that he may start on the next lesson. Through this self-evaluation procedure the student is supposed to learn to know his learning objective, how well he is succeeding in attaining it, and perhaps more important, perceive that the entire learning process consists of mastering a succession of relatively small steps. As noted above, however, many of the younger students were not able to direct their own learning effectively, in spite of the incentives.

WLC's program reflected extensive study and design by educational researchers and curriculum authorities. It had been applied in various situations—for example, in WLC's Albuquerque Center, which offered remedial instruction on an after-school

basis. WLC therefore anticipated no serious difficulties in implementing the program in Gilroy, but in fact, two major problems arose.

The first was logistical. As previously discussed, the physical arrangements were not ideal. Also, implementing this type of program in the Gilroy context of 50 students, a teacher, and an aide, turned out to have special characteristics. In the early fall, students needed help with their lessons, or they needed to have assignments checked, progress tested, permission granted to go to the reinforcement center, and so forth. Sometimes they waited in queues for as long as half an hour, with resultant frustration for teachers and children alike. In Albuquerque, WLC dealt with such problems by using extra personnel at the start of a project. In Gilroy the teachers had to "go it alone" and the logistics difficulties offset many of the potential advantages of the individualized nature of the program.

The second problem was the appropriateness of curriculum and materials for the Gilroy situation. One aspect of this problem was expressed to us by a WLC official. He stated that WLC had not fully appreciated the special requirements imposed by the students' being bilingual. He stated that if he had the program to do over he would have sought more specialized bilingual materials.

A second aspect of this problem appears to have stemmed from the students' being quite young. According to our observations, the materials seemed to assume that all the children were "ready" for subjects such as modern math. In fact, many of the students in the program had absorbed few of the concepts needed for mathematics and reading skill instruction. Some of the children appeared to need a readiness program rather than a reading or math program. This view was supported by some teachers' comments to us.

A third aspect of the problem was that some of the Gilroy Center personnel questioned the WLC approach to minimizing the teacher's involvement in the student-teacher-materials loop. They supported the concept of student control over their own learning, but felt that some of the children needed a more personalized approach. They believed that some students learned faster if the teacher worked with them. Toward the end of the year, we observed teachers and aides taking individual students into the on-site manager's office for tutoring sessions.

There are many pros and cons about whether or how the basic WLC program should have been modified. These are not important here; what is important is that both WLC and GUSD personnel believed that changes were required. Changes were accordingly made, but not early enough. In discussions with people involved in the program, the point that came across most forcefully was that the teachers should

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have been involved earlier and more extensively in the design and implementation of the program.

ESTIMATED PROGRAM COST

It is hard to determine what this program cost or might cost in future years or in some other school district. WLC costs are proprietary. Undoubtedly there were many start-up costs and learning costs that might be avoided in other years or programs. Consequently, the actual cost of the Gilroy program, even if it could be obtained, would not be very instructive for other school districts.

A more helpful approach is to consider the resources involved in the Gilroy WLC Center and what these might reasonably be expected to cost. We have developed such an estimate based on three assumptions:

- that school space is available for the program at no charge;
- that the diagnostic-prescriptive functions will be managed by the teacher in charge of the program; and
- that management will be performed by the regular district staff at no increase in cost.

Table 2 presents the estimated acquisition and operational cost of the program. The cost data are, for the most part, estimates of the program as conducted in Gilroy in the 1970-71 school year, but the division of expense between the district and the contractor is not shown. The Telex remote diagnostic and prescriptive services that WLC used are not included. It is also assumed for this exercise that the on-site function of contractor management will be undertaken by the regular district staff; therefore, no cost for general management is included.

We estimate that a program like that in Gilroy in 1970-71 might be conducted for around $40,000. Dividing this by 100 students and two subjects each, this would be a cost per student per subject of about $200. Such a figure would be higher than is usual for conventional programs, but it is not out of line for remedial programs. Of course, cost per student is an input measure and is not very instructive. The more meaningful question is whether such a program produced sufficiently higher achievement gains to justify spending more than Gilroy would normally spend in conventional instruction. We will consider achievement in the next section. The

Table 2

ESTIMATED PROGRAM COST

Acquisition cost		
Program activities		
Implementation: 1 month planning; organization, scheduling	$ 1,500	
Pre-service training: 2 teachers, 4 days	600	
Installation of equipment	200	
Equipment: tape recorders, cassettes, headphones	3,000	
Facilities: furniture (tables, chairs), carpeting, study carrels, storage space	2,000	
Materials		
Educational: books, tapes, filmstrips, etc.	3,000	
Activities: games, toys, etc.	2,500	
Total estimated acquisition cost		$12,800
Operational cost		
Program activities: in-service training	0	
Salaries		
Specialists (1 fulltime equivalent)	14,000	
Paraprofessionals (3)	10,500	
Materials		
Consumables, $10/student	1,000	
Incentives, $25/student	2,500	
Equipment		
Replacement (10% of equipment cost)	200	
Maintenance	200	
Total estimated operational cost		$28,400
Total estimated costs		$41,200

important point here is that performance contracting in Gilroy involved spending more than GUSD spends on their regular instructional program but not more than they spend on other compensatory programs. From Title I reports, we estimate that Gilroy spends in the neighborhood of $185 per student on remedial reading programs and about $200 per student for remedial mathematics. In part, the high cost in the WLC Center reflected the small number of students in the program. Other performance contracting programs studied by Rand have somewhat lower costs because of economies of scale. The significant point for Gilroy is that the WLC program was more expensive than ordinary classroom instruction but not out of line with the cost of other remedial programs.

TESTING

We made a special study of testing procedures because contractors are paid on the basis of achievement scores, and because in Gilroy two kinds of achievement tests were administered on a pre- and post-test basis. The SAT was administered by teachers on September 23, 1970, and we sat in the room while the second and fourth grades were tested. We also observed the MAT administration by a psychometrist on October 7 and 8.

In general, what we observed raised serious questions about the reliability of achievement test data for young student populations such as those in the Gilroy project. We will not review here the philosophical and statistical questions that have been raised about the reliability or interpretation of gain scores for performance contracting purposes. (GUSD officials understood these questions and were concerned about them. One administrator discussed with us at length his reservations about administering achievement tests to selected populations of students who fall on a "tail" of the distribution of the population on which the test was normed.)[2] The *mechanics* of test-taking by populations such as those in the Gilroy program, however, lead us to suspect that there must be a very large error component in any individual student's score.

The test administrators had a difficult time following the specified standard

[2] For more on testing issues, see Vol. 1 of this series, M. B. Carpenter and G. R. Hall, *Case Studies in Educational Performance Contracting: 1. Conclusions and Implications*, The Rand Corporation, R-900/1-HEW, December 1971, and references cited therein.

procedures for the instruments. They had to spend much of their time controlling the children and trying to hold their attention. In some cases the administrators felt it necessary to deviate from the prescribed timing or standard text. The mechanics of taking achievement tests seemed to confuse many students, who apparently resorted to filling in answers without pondering over the questions.

To illustrate, we followed the eye movements of one youngster who never read the stem of the question, but simply marked the answer columns. During a break in one of the testing sessions we talked with several of the children about the test and what they were doing. Because they did not understand the instructions, or because they could not understand the stems of the items, they made up their own rules for the "game." One child marked the one word he understood out of the four alternatives; another chose and followed a pattern whose rationale escaped us, if it had one at all.

Such problems are to be expected. The Gilroy pupils were quite young, many of them had a limited command of English, and they were not able students. Confronted with instructions they found murky in a situation with no compelling interest for them, they devised impromptu solutions that worked for *them,* however frustrating they were for school authorities, contractors, and researchers.

Standardized tests were not designed to serve individual diagnosis or to evaluate the efficacy of instruction with respect to individual students. They were designed for analyses in which mean scores are adequate and the unreliability of individual scores presents no major difficulty. If performance contracting programs continue to involve students with learning and language problems, however, the problems of testing and test administration for such populations will have to be addressed. Perhaps the answer is to devote more painstaking care to the form and phraseology of instructions or perhaps to devise entirely new types of instructions. Perhaps the answer is a new type of test altogether. We are not able to prescribe a remedy but the problem is serious, as the Gilroy experience shows.

V. ACADEMIC ACHIEVEMENT

READING ACHIEVEMENT

Between the pre-test in October and the post-test in June, in the second grade there was three months growth, in the third grade five months, in the fourth grade seven. (We are using mean scores, which avoid some of the statistical error problems discussed in Sec. IV. Even so, the statistical meaningfulness of these test results remains in question considering the problems of obtaining gain scores in general and for populations such as the Gilroy students in particular.) Data on the tests are presented for both mean scores and median scores in Table 3.

All gains must be considered in relation to a standard or some comparison group. Compared with WLC's initial expectations, the gains were certainly disappointing. WLC expected at least one year's gain per student. Some students made such gains, but most did not. In comparison with the rest of the district's Title I program, however, the WLC students did better.[3] On the MAT, third-grade students in the Center gained six months, while the rest of the Title I students gained four months; in the fourth grade, the WLC students gained seven months, the rest three. The WLC program accomplished more than other programs aimed at the same population in the district.

We were interested in determining if the student's entering achievement scores

[3] GUSD Annual Evaluation Report, ESEA Title I, July 15, 1971.

Table 3

READING ACHIEVEMENT IN WLC AS MEASURED BY SAT

	Mean Scores			Median Scores		
Grade	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
2	1.4	1.7	0.3	1.4	1.6	0.2
3	2.1	2.6	0.5	1.9	2.7	0.8
4	2.6	3.3	0.7	2.6	3.3	0.7

affected the amount gained. Did students with low pre-test scores gain more than students with high test scores? Such a result might have been expected if the regression-to-the-mean effect was an important influence. To answer this question, we divided each class into thirds based on their pre-test and computed gains for each of the subgroups. There are differences, but they are neither consistent, as can be seen from Table 4, nor statistically significant as determined by a t-test. This result implies that regression to the mean does not explain the gain scores.

Another question that deserved consideration was whether there were "rub-off" effects from the WLC Center on the achievement of the students in Eliot School who did not participate in the WLC Center (nonprogram students). Nonprogram students in Eliot are really a different population from the program students, because normally those students with the greatest educational deficits are selected to participate in Title I programs. The means of the pre-test achievement scores for Title I and for other Eliot students are significantly different at the .01 level of significance as measured by the t-test. Table 5 lists the pre-test means for the two groups. As would be expected, the Title I students participating in the WLC Center started with

Table 4

READING ACHIEVEMENT BY THIRDS IN WLC
AS MEASURED BY SAT

Grade	No. of Students	Third[a]	Pre-test Mean	Post-test Mean	Gain[b]
2	10	1	1.2	1.5	0.3
	14	2	1.4	1.6	0.2
	9	3	1.5	1.9	0.4
3	12	1	1.7	2.3	0.6
	12	2	2.0	2.4	0.4
	10	3	2.8	3.3	0.5
4	8	1	2.2	2.9	0.7
	7	2	2.6	3.2	0.6
	7	3	3.0	3.8	0.8

[a]The figure 1 represents the lowest third of the grade in entering reading scores.

[b]As of June testing.

lower mean scores than those of the nonprogram students at Eliot. Furthermore, because the Center absorbed so many students, the nonprogram students enjoyed the windfall advantage of very small classes. It therefore seemed possible that decreased class size as well as other possible influences might have affected nonprogram student achievement.

The pattern of gains for the two groups, shown in Table 5, does not show any consistent difference, however. While the nonprogram students made greater gains in the second grade, the WLC students did better in the third grade. Small class-sizes yielded no notable achievement-score benefits to the nonprogram students.

Table 5 has an implication for interpreting the outcome of the program. Examination of the pre-test scores indicates that the students placed in the WLC Center

Table 5

READING ACHIEVEMENT OF WLC AND NONPROGRAM STUDENTS AS MEASURED BY SAT

	WLC			Nonprogram		
Grade	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
2[a]	1.4	1.7	0.3	1.9	2.6	0.7
3[b]	2.1	2.6	0.5	3.1	3.3	0.2
4[c]	2.6	3.3	0.7	3.7	4.5	0.8

[a]Significant at the .01 level.

[b]Significant at the .04 level.

[c]Not significant.

had been steadily falling behind their Eliot School cohorts as their schooling progressed. The WLC program may not have enabled the Title I students to catch up, but there was no appreciable widening of the gap in grades 3 and 4, although the gap widened in grade 2.

MATHEMATICS ACHIEVEMENT

WLC had greater mathematics achievement gains than reading gains, but the differences between the gains in the two subjects were not statistically significant (by t-test, using the .05 level). Only the fourth grade achieved the objective of one achievement-year per calendar year. Using mean scores, the second grade gained five months on the SAT, the third grade seven months, and the fourth grade 1.1 years. Table 6 shows both mean and median data.

A comparison of the gains made in mathematics by the students in the WLC Center and by other Title I students presented an anomaly: gain was one year for

Table 6

MATHEMATICS ACHIEVEMENT IN WLC AS MEASURED BY SAT

	Mean Scores			Median Scores		
Grade	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
2	1.5	2.0	0.5	1.5	2.0	0.5
3	2.1	2.8	0.7	2.1	2.6	0.5
4	2.5	3.6	1.1	2.4	3.2	0.8

the district as a whole in the third grade; for the WLC Center students it was seven months. In the fourth grade, on the other hand, the gain for the district as a whole was six months; for the WLC Center students it was 1.1 years. The results suggest —perhaps speciously, perhaps not—that the district's program is peculiarly effective for the third grade and WLC's for the fourth.

We analyzed the differential effect depending upon a student's entering achievement score. The evidence is even stronger here that the gains achieved are not artifacts of the regression-to-the-mean effect. No significant differences in amount of gain can be attributed to entering scores (as determined by a t-test using .05 level of significance). In fact, in every grade students with the highest entering achievement scores gained as much as or more than did students with lower scores, and the gains in the fourth grade are the largest for all groups. The data are presented in Table 7.

We also compared the gains in mathematics for students in Eliot School who did and did not participate in the WLC Center. They proved to be nearly identical (see Table 8). Again, the nonprogram students both started and ended the year with higher achievement levels. Thus, in mathematics as in reading, the extra resources made available by existence of the WLC Center at Eliot do not seem to have measurably benefited the nonprogram students. There is also a bright side for the WLC students: as in reading, the differentials between the WLC students and other students at least did not widen in 1970-71.

Table 7

MATHEMATICS ACHIEVEMENT BY THIRDS IN WLC
AS MEASURED BY SAT

Grade	No. of Students	Third[a]	Pre-test Mean	Post-test Mean	Gain[b]
2	9	1	1.2	1.7	0.5
	11	2	1.4	1.9	0.5
	13	3	1.7	2.3	0.6
3	10	1	1.5	2.1	0.6
	11	2	2.1	2.6	0.5
	13	3	2.7	3.5	0.8
4	7	1	1.9	3.0	1.1
	7	2	2.4	3.5	1.1
	8	3	3.0	4.1	1.1

[a]The figure 1 represents the lowest third of the grade in entering mathematics scores.

[b]As of June testing.

IMPLICATIONS

If program success is measured against the standard announced at the beginning of the program—one achievement-year gain per student in reading and in mathematics—then the program was a failure. If the standard is an improvement in the scholastic achievement of Title I Gilroy students, then the program looks more favorable. The pupils in the WLC Center generally did better than similar Gilroy students not in the programs, and they recorded gains similar to those of non-Title I students at Eliot.

Two considerations forestall any easy judgments, however. First, the WLC program cost more than the usual Gilroy instructional system. Perhaps had more money been spent in conventional ways, as good or better results might have been

Table 8

MATHEMATICS ACHIEVEMENT OF WLC AND NONPROGRAM STUDENTS AS MEASURED BY SAT

	WLC			Nonprogram		
Grade	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
2	1.5	2.0	0.5	1.9	2.6	0.7
3	2.1	2.8	0.7	2.7	3.4	0.7
4	2.5	3.6	1.1	3.2	4.3	1.1

achieved; perhaps not. Since there is no equal-cost conventional program to compare with the WLC achievement, one cannot make cost-effectiveness comparisons. All one can say is that the WLC program both cost more and produced somewhat higher achievement scores.

The other consideration is that 1970-71 was the development year for the WLC project in Gilroy; if the Center had been continued, future years might have seen higher gains. As discussed previously, there were significant changes in schedules, curriculum, and procedures during the year. Perhaps they might have produced more substantial gains in future years. This possibility suggests the advantage of multiyear programs and the prematurity of evaluating a program on the basis of a single year's results.

THE GENERALIZABILITY OF ACHIEVEMENT GAINS

It is a perennial and still unsettled issue whether reading-achievement scores produced under any sort of program, including performance contracting, bear a direct relationship to the skills necessary to do ordinary schoolwork. When we raised this issue, GUSD expressed a willingness to cooperate in an effort to obtain some data on this point. The school-district psychometrist and the principal of Eliot School agreed to administer a small number of individual reading tests. The test selected

was the Gray Oral Reading Test (GORT). It is a relatively short test, taking about 15 or 20 minutes to administer. The objective was to see how students with various achievement gains as measured by the usual norm-referenced tests would score on a different type of reading test, one possibly more related to the type of exercises they might perform in a classroom.

The GORT was to be administered to 4 students from each grade—2 with high and 2 with low achievement scores on the SAT. The scores on the two tests are shown in Table 9 (one high-scoring fourth-grader was omitted from the table because his SAT score was missing). The choice of subjects was left to the psychometrist.[4] In defining low and high, he used the results of the SAT administered at the end of the school year. Figure 3 is a graph of the SAT and GORT scores. While we did not compute the correlation because of the small number of observations, we have drawn the line on the figure representing a perfect correlation between the two scores. We interpret the relationship between the test scores as indicating that both tests do tap many of the same skills. A student who does well on the SAT, which is a group paper-and-pencil test, is also likely to do well on an individually administered test in which he demonstrates his oral reading proficiency for an examiner. Of the 11 scores, 10 show a very good correlation between the two tests. One pair of scores (3H) has an unusually large spread. The relationship among the other scores is so consistent that we wonder about the discrepancy. One possible explanation is that the GORT is not scored for comprehension although the SAT is, and that the comprehension questions lowered the student's SAT score.[5]

All in all, it would appear from this small sample that the SAT is a reasonable proxy for an elementary student's ability to read as measured by individually administered oral tests, and that it is plausible that the performance contract in

[4] The sample he selected contains some ambiguities. For example, one student who was chosen as a low-scorer from grade 4 had a higher score on the SAT than did another student who was designated as a high-scoring fourth-grader. Going back to the original data in an attempt to reconstruct the way in which students were chosen did not yield a systematic explanation. It is probably of no great import because there was no systematic selection of students to take the GORT. On the other hand, it leaves us in the position of saying somewhat reluctantly that we cannot adequately describe these students either as a sample who scored high or low on the SAT or as a sample who made good or poor gains on the SAT. Nevertheless, the data support the notion that for those students tested both of these tests are measuring reading skills. There is no justification, however, for suggesting that any other two sets of scores would produce the same kinds of results or that another sample would. It should also be pointed out that the standard error of measurement of the SAT reading test is larger than the difference between the SAT and the GORT scores.

[5] O. K. Buros (ed.), *The Sixth Mental Measurement Yearbook*, The Gryphon Press, Highland Park, New Jersey, 1965, p. 842.

Table 9

GORT AND SAT SCORES FOR A SAMPLE OF STUDENTS

Student	SAT	GORT
2L	1.4	1.1
2L	1.4	1.3
2H	2.2	2.3
2H	3.4	3.0
3L	1.8	1.7
3L	2.0	2.0
3H	2.7	3.2
3H	3.9	6.9
4L	2.5	1.9
4L	3.7	3.2
4H	2.9	2.6

reading improved the students' reading ability and not some other set of related skills. Of course the small sample and the large standard error of measurement for the SAT data mean that these results must be regarded as no more than suggestive. They do indicate the feasibility, in performance contracting, of examining the degree to which achievement gains on standardized tests correlate with other measures of ability. They also suggest that norm-referenced tests may be better proxies for achievement than many have believed. Unfortunately, any firm conclusions on these topics require more data.

DOES THE CHOICE OF AN ACHIEVEMENT TEST MAKE A DIFFERENCE?

If measurements of achievement-gain vary according to which test is administered, the phenomenon is obviously important for performance contractors, who are paid on the basis of these measurements—and for the school districts that pay them. This is another unsettled issue that has generated more argument than empirical

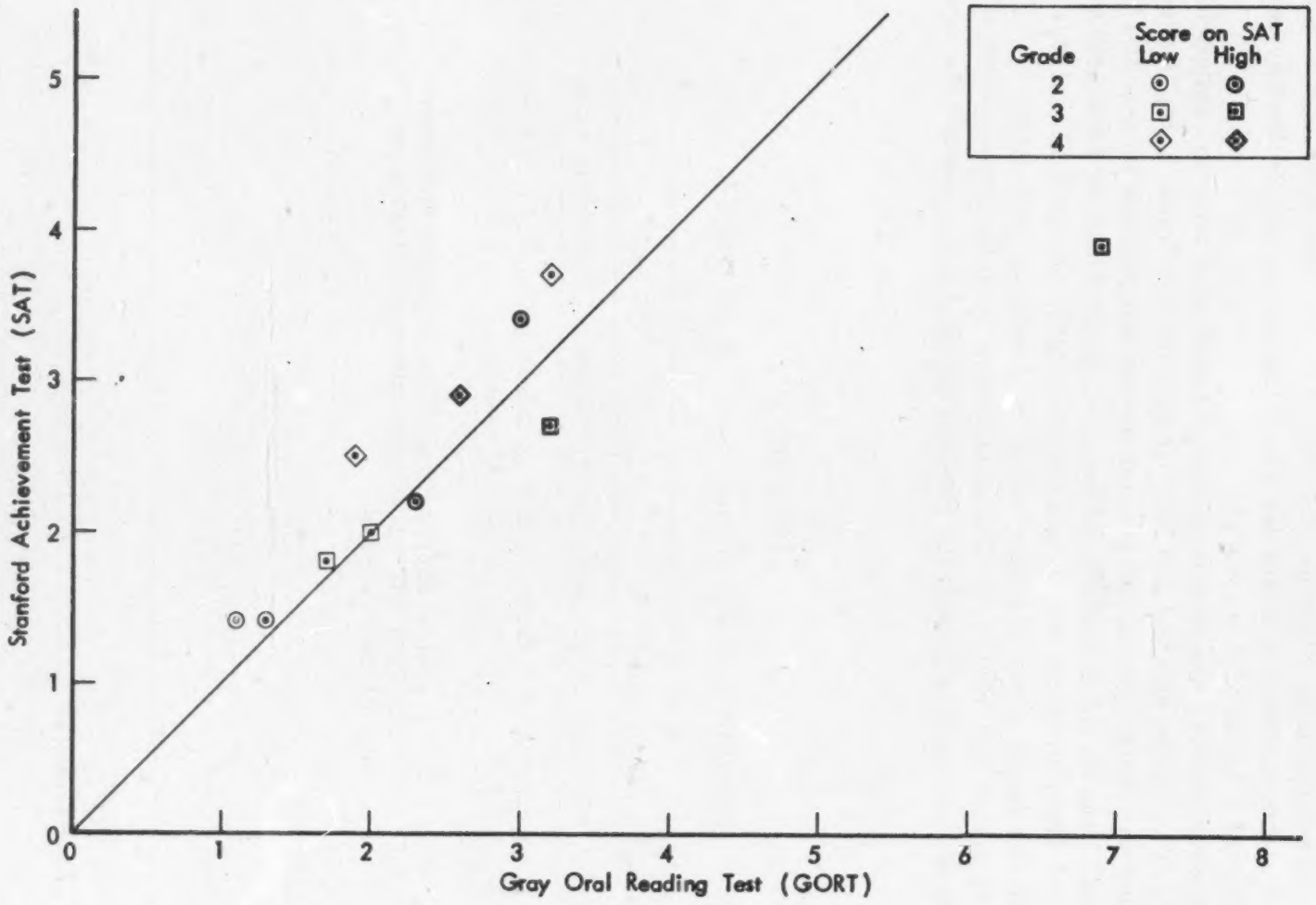

Fig. 3—GORT and SAT scores for a sample of students

data; it would be helpful for everyone concerned if more schools conducted parallel tests with the same students, as Gilroy did. The Gilroy data do not resolve this issue, but they provide a further bit of evidence.

As discussed, the SAT was used as the basis for contractor payment, and participants in the WLC Center also took the MAT, the district Title I test. Table 10 shows for the third and fourth grades, the pre-test means, the post-test means, and the gains on both tests for those students in the program for whom we have both sets of test scores. The gain in the third grade was five months on the MAT and four on the SAT; in the fourth grade, the gain was seven months on both tests.

At least in this case there is no substantial difference in the achievement-gains reflected by the two tests, although the pre- and post-test scores are not the same.

Table 10

COMPARISON OF WLC READING GAINS ON MAT AND SAT

	MAT			SAT		
Grade	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
3	2.4	2.9	0.5	2.3	2.7	0.4
4	3.0	3.7	0.7	2.6	3.3	0.7

NOTE: These scores differ from those reported elsewhere because this analysis includes only students for whom we have both sets of test scores.

VI. OTHER ASPECTS OF THE PROGRAM

This section discusses the reactions of students, parents, and GUSD personnel to the program.

STUDENT REACTION

GUSD project personnel conducted 36 interviews with students in the program. A standard form was used but not all children responded to all questions. The first question was, "What did you like about Westinghouse?" In answer, 10 students said they liked the coupons or reward scrip the most, 8 liked the activities area, 6 liked reading books, 3 liked the math instruction, 2 the candy, 1 the tests, and another liked the teachers.

The second question was, "What didn't you like about Westinghouse?" The largest number of students, 5, responded "noise," and 3 students said it was too long. Concerning the "buzz break," the 5-minute period in the activities area, 33 students said they liked it, 3 that they did not. In response to the question, "What did you think about using tape recordings and tapes to learn lessons?," 22 students were favorable and 10 unfavorable.

Another question was, "How did you like going on shorter sessions?" This question referred to the change in the program instituted after the tests at the 120-hour

point, when instead of having 50 students in 2-1/2-hour sessions, each session was divided into two and 25 students at a time went to the Center for 1-1/4 hours. The response was largely in favor of the shorter sessions; 24 students said they preferred them. When asked why, their responses were that they did not get as tired, it was quieter, and they got more help. But 8 students said they preferred the longer sessions because they had more work time and got more done.

Since only about 30 percent of the students were interviewed, and we are not sure they were selected randomly, we would hesitate to extrapolate these answers to the student population as a whole. Nonetheless, this sample of students seems to have liked the program and the reward system.

STUDENT ATTENDANCE

It is extremely difficult to measure a program's emotional and nonacademic effects. Performance contracts have so far been applied largely to reading and mathematics, partly because there are standardized and accepted measuring instruments in those subjects. On the other hand, all teachers, administrators, and firms that have entered into performance contracting have expressed concern about the long-term effects on students. Something is lost if a child is jockeyed into a dramatic increase in reading ability if in so doing he learns to dislike reading. Consequently, everyone concerned with innovative programs is concerned about measuring their noncognitive effects.

Such measurement is beset with pitfalls. Questionnaires are often used, but one needs to be wary of student responses to questionnaires, particularly in a school setting. Students learn conformity in most school situations, and tend to believe tenaciously that there is a "right answer" for every question. Even on a questionnaire, they tend to cast about for the elusive right answers or to answer demurely what they think the teacher wants to hear. Because of this, administering questionnaires about attitudes to an elementary population, and especially to students in the early grades, leads to questionable estimates of effects on children's attitudes.

For this reason, there has been a search for unobtrusive quantifiable data that could be used as a surrogate for attitude change. Unfortunately, there are no unobtrusive measures that are obvious and good proxies for noncognitive effects. Attendance is often used as a measure, on the basis that unhappy students are more likely to play truant than are happy students. Yet, attendance may be controlled more by

family necessity than pupil choice, and factors other than the student's views about a particular course or program may motivate his absences. Nonetheless, for want of a better alternative, attendance continues to be used as an index of affective change.

We were able to get attendance figures for project participants in Gilroy during 1970-71, when they were in the second, third, and fourth grades, and also for the previous year when they had been in the first, second, and third grades. Table 11 presents the data. Absenteeism decreased in the third grade; it increased slightly in both the second and fourth grades. (None of these differences are statistically significant.) Without explanatory historical data for each student absence, there is no basis for imputing changes in attendance patterns to the effects of the program. The appropriate conclusion is that the Gilroy attendance figures do not indicate much of an affective impact—either positive or negative—on students.

Table 11

ATTENDANCE FIGURES FOR WLC PARTICIPANTS

Grade	No. of Students	1970-71 Average Absence per Student	Grade	1969-70 Average Absence per Student
2	32	12.0	1	11.5
3	33	10.0	2	11.8
4	24	8.0	3	7.8

PARENT REACTION

At the end of the program a short questionnaire in both English and Spanish was sent home to the parents of children who had participated in the program. About half responded.

The overwhelming majority, 48 out of 53, were pleased with their children's

experience in the Center, liked the reward system, and indicated that their children liked the reward system. Other questions elicited more variation in response. Not all parents felt they could judge their children's progress as compared with the previous year. Of those who did answer the question, the large majority, 34 out of 44, believed their children progressed more than they had last year. In response to the question, "Do you think your child learned more because of the reward system?" two-thirds of the parents answered "yes." Most said their children were happier in school in 1970-71; only 3 of 49 parents answering the question believed their children were less happy.

All in all, the responding parents seemed quite pleased with the program. There was a space on the questionnaire for parents' comments. Not many parents used it, but of those who did three commented that their children had a new interest in learning. Two others were more specific; one said, "My child wants to spell every word he sees," and another said, "When we are travelling my child wants to read every sign on the road." One parent said her child expressed more interest in learning arithmetic, her weakest subject. One comment was that the teachers also seemed more interested in teaching, and that this of course was good for the children. A few parents commented on the reward system, observing that rewards stimulated their children's interest in learning, or made them want to do better work, or spurred them on to complete their work. Of the two negative comments on the reward system, one parent simply said, "My son was unhappy. He did not care about the rewards," and the other said, "My children liked the rewards but not enough to work hard all the time." Two comments were interesting because contradictory: "The program was good because no pressure was put on the children," and, "The program was not demanding enough."

It is anyone's guess whether these responses also reflect the opinions of parents who did not answer the questionnaire. One suspects that the respondents may have been motivated by a healthy bias: since most of them were in favor of the program, they may have filled out the questionnaire in hopes that their support would ensure the continuance of such programs in the future and that their children would again have an opportunity to participate. On the other hand, it would have been reasonable to expect numerous negative responses if dislike for the program had been very common among parents. Apathy and reticence were probably more prevalent than active opposition.

DISTRICT PERSONNEL REACTIONS

To examine teachers' and administrators' reactions to the WLC Center, we conducted a series of interviews during the school year and at its close. We talked with GUSD officials, including the superintendent and the administrator responsible for overseeing the program, the administrator in charge of all special programs, the principal of Eliot School, the psychometrist and psychologist attached to the district office, the teachers and instructional aides in the program, and teachers in the school who did not participate in the program. Without attributing statements to particular people, we present a summary of opinion.

Everyone was asked at the end of the year, "What would you do differently if you had it to do over again?" The first response of all the people we talked with was always the same: that they would get the teaching staff involved earlier. As discussed in Sections III and IV, the program underwent a number of significant changes in its organization and conduct. Teacher inputs to the change-decisions were important. Looking back, however, the consensus was that more and earlier teacher involvement would have been very advantageous.

There were some tensions at Eliot School between the program staff and the nonprogram staff. Nonprogram teachers found it disruptive to have students going in and out of the classrooms to attend the Center. It made scheduling lessons and carrying out many classroom activities difficult. The tension among the Eliot staff lessened as the year wore on, however, and disappeared by the time the results of the 120-hour testing had been released. The testing results made it apparent that the students in the program had not made unusual gains. Apparently, the nonprogram teachers had felt threatened by the WLC Center because, whether it was stated or not, they knew they were going to be compared with another—and outside—group, brought in to raise student achievement, and therefore bringing with it the implicit notion that the teachers had been tried and found somewhat wanting. True, the program teachers were not outsiders to the system; they had previously been GUSD Miller-Unruh reading specialists. The introduction of WLC into the district, however, even using local teachers, could not help but set up some degree of rivalry between "insiders" and "outsiders."

After the 120-hour results had been released, it was possible to institute a change in the program that the program teachers and the on-site director had wanted to institute much earlier in the year but that the nonprogram teachers had

not accepted. This was the previously discussed shift from 2 to 4 sections, proposed in the fall by the WLC Center staff but opposed by the nonprogram staff on the grounds that there had been too many disruptions to their programs and they could not accommodate to more. After the test results appeared, the other teachers were more willing to inconvenience themselves for the benefit of the Center.

As the year progressed, both program and nonprogram teachers began talking about operating their own learning center in the school. They were beginning to accept the kind of instruction taking place in the WLC Center and to think about how they would run such a program without an outside agency in the school. There was more and more talk among the teachers of adapting the WLC Center to district operation on a continuing basis. In the spring some actual proposals were made. The possibility of Center continuation under teacher sponsorship will be discussed further in the next section.

VII. CONCLUSIONS

It would be simplistic to dub the program either a success or a failure. The answer to this question has several dimensions, some negative, some positive. From the viewpoint of WLC, the program must have been a financial disappointment. The details of the financial settlement are under negotiation between WLC and GUSD, and how much WLC will be paid is unknown.[6] The interpretation of the achievement results and the financial implications of the program changes apparently are at issue. It is clear from the final test data that payment for achievement will be considerably less than the maximum payment possible, which required students to make either one year's gain per subject per student or achieve what the contract calls the objective gain. This latter, the reader will recall, is a goal specified by WLC for each student based on the results of the diagnostic testing carried out at the start of the program. In general, the objective-gain computation represented achievement-level goals for the end of the year closer to national norms than normally would be expected for these students or than had been made by Gilroy Title I students in the past. The minimum objective gain for any student was 1.3 year's growth.

[6] The sparseness of information on the outcome of Gilroy and other performance contracting programs merits a comment. Educators are used to open dissemination of data about experimental programs. Because performance contracting programs entail financial settlements, however, it is likely that results will not be made public until all claims have been resolved. This may take years if the claims are under litigation.

How many of the students qualified for achievement payments as measured by the final test has not been announced. On the basis of the test results at the end of 120 hours of instruction (around Easter), it would be surprising if many did. On the 120-hour test only 6 percent of the students had gained a year in reading and only 16 percent had gained a year in mathematics.

In the spring of 1971, WLC discontinued its school operations division. Gilroy was only one of several WLC programs, but it seems reasonable to suppose that the financial outcome in Gilroy contributed to WLC's decision.

From the standpoint of the academic aspirations of both WLC and GUSD, the results were also discouraging. Both had hoped that the program would solve Gilroy's compensatory education problems, and bring Title I students up to national achievement-test norms. It clearly did not do this.

It would be wrong, however, to write off the Gilroy program as merely another failed experiment. First, the WLC students surpassed their other Gilroy counterparts, and the gap between the Title I and other students at Eliot at least did not widen in grades 3 and 4. Second, the Gilroy program evolved through the year; gains might be greater under some steady state in the future.

Even apart from these considerations, the program seems to have served as an agent for curriculum change in Gilroy. The staff at Eliot School became very interested in the WLC activities. As the year progressed there was a great deal of cooperation between the on-site director and the teachers in the WLC Center. The teachers made suggestions about program changes and additional material, most of which WLC accepted.

Since WLC has discontinued its school operations division, it cannot maintain the Center in Gilroy. But the teachers at Eliot School, both those who had been in the program and those who had not, submitted a proposal to the Superintendent to run their own reading resource center in 1971-72, largely modeled after the WLC Center. The district has some discretionary funds available, but this proposal will have to compete with other proposals from other schools that also want to run innovative programs. As of this writing, the proposal has not yet received official approval but the teachers' interest has not flagged; they hope to win final approval in 1972. Whether or not the new center is funded, the performance contracting experience of 1970-71 has apparently inspired the Eliot teachers to develop an individualized program of instruction.

In sum, the Gilroy program had three important outcomes. First, the students did not make the large achievement gains that would have brought financial reward

to WLC and permitted GUSD to lessen the gap between reading and mathematics scores at Eliot and its non-Title I schools. Second, the students at WLC center scored achievement gains somewhat higher than those of other Title I students. Third, the program created interest among Gilroy teachers in intra-GUSD applications of the Westinghouse technology for a more individualized instruction.

The Gilroy program also points to two general conclusions that are significant for the planning, management, and evaluation of performance contracting programs in general. First, it is unlikely that life will ever be so simple as to permit a school or contractor to set a fixed and complete system in motion and then measure the extent to which it meets clearly specified objectives. Instead, they are more likely to find themselves managing a constantly changing program and trying to judge the outcomes of the evolution. This conclusion has several implications.

First, it is important that the written contracts contain provisions that allow flexibility for needed changes. Programs like the one in Gilroy usually start off in a warm atmosphere of mutual good will, with the good-natured expectation that the contractor and the school district will be able to iron out, as they come up, difficulties that will affect the contractor's payment. Very often, this expectation is overly sanguine. In Gilroy, as in other programs, the contract is yet to be settled and data are therefore kept confidential. The obvious but specious implication is that both parties should spell matters out in meticulous detail at the start of a program, but such advice is a counsel-of-perfection and would probably be counterproductive if it froze out the flexibility needed for healthy changes along the way. The Gilroy program, and many others, demonstrate that there is no off-the-shelf program that can be implemented without substantial change. Clearly, provisions for change must be made, and change is sure to have financial implications. The best strategy may be to expect problems in resolving the financial outcomes of programs, and establish in advance at least the procedures to follow for instituting changes and dealing with the altered financial liabilities they entail.

The likelihood of program change has two other implications, both discussed previously. One is the advantage of early involvement of teachers in program development and implementation. The other is the advantage of multiyear programs over single-year programs. The Gilroy experience indicates that it is perhaps too much to ask either a contractor or a school to devise, within a single year, a well-articulated program nicely calibrated to the district's needs and resources.

The second general conclusion emerging from the Gilroy program is that performance contracting is likely to have multiple outcomes, and the value of the

program is likely to depend on the relative weights assigned to these outcomes. The Gilroy program seems to have been much more useful as a curriculum change agent than as a compensatory education program.

Appendix

GILROY-WLC AGREEMENT

This Agreement, dated 9 July 1970, is between (1) Gilroy Unified School District (SCHOOL), 7663 Church Street, Gilroy, California 95020, and (2) Westinghouse Learning Corporation (WLC) a Delaware Corporation with headquarters at 100 Park Avenue, New York, New York 10017.

It contains all the terms and conditions under which WLC will provide and the SCHOOL will purchase and use, the WLC Learning Center Program (PROGRAM) during the 1970-71 school year.

1. Background and Purpose

The PROGRAM has been developed by a team of psychologists, educators and systems managers during a period of several years of research and development effort. It is a program for the systematic and effective management of learning, valuable for remedial, regular, and enrichment purposes, completely individualized, and selfpaced. In operation, it has five major elements or phases:

--Diagnosis. The student's strengths and needs are identified through a variety of tests designed to establish what he already knows and what he needs to learn.

--Prescription. A course of study is planned for each student, specially designed to take advantage of his

present achievements and to concentrate on the areas of his greatest need.

--Learning Materials. Each unit in the course of studies refers the student to learning materials that have been selected as being most effective or efficient for him to use in learning the content of that unit.

--Motivation. Each student participates in a system for planning and scheduling his study program; in this way, he learns to assume increasing responsibility for the objectives and the management of his own work, of his study program, and this in turn motivates him to accomplish it successfully and well.

--Evaluation. Progress tests measure the student's achievement in reaching his learning goals. These measures of achievement are used for following and aiding the student's progress. They are also the basis on which the PROGRAM is judged and paid for.

Under this agreement WLC will establish and operate a Learning Center in Gilroy to provide reading and math instruction to elementary students. The objectives of the PROGRAM are that all students enrolled in it will (a) advance at least one grade level in reading and math at the end of the fiscal year 1971 (June 30, 1971), and (b) will further progress to performance levels at or near the grade level at which they are enrolled in school.

2. Preparation

A. To prepare for the opening of the Center and for the operation of the PROGRAM, WLC will do these things:

(1) Not later than 20 July 1970, WLC will provide the SCHOOL with a complete and detailed description of the space and furnishings required to operate the PROGRAM so that the SCHOOL will have sufficient time to make suitable space ready for the PROGRAM prior to the beginning of the school year.

(2) WLC will assign from its staff a manager to operate the PROGRAM. It is expected that the Center will have at least two additional staff members. One of these will be a teacher assigned to the Center from the SCHOOL staff and paid by

the SCHOOL. WLC will also employ one or more aides in the Center. It is understood that the number of aides on duty in the Center at any time may be adjusted according to the number of students in attendance. WLC will provide all training required for all teachers and aides who will be working in the PROGRAM.

(3) WLC will furnish all educational equipment and all educational and motivational materials required for use in the PROGRAM. (This equipment and these materials will remain the property of WLC.)

B. To prepare for the opening of the Center and for the operation of the PROGRAM, the SCHOOL will do these things:

(1) The SCHOOL will make available, in or near the Eliot School, suitable space for a Learning Center to accommodate up to 52 students. The space will be made ready not later than 20 August, 1970, to meet the requirements of the PROGRAM as described by WLC. The SCHOOL will also make available adequate office space in or near the Learning Center for the use of the WLC staff manager and his secretary. The SCHOOL will provide all furniture (tables, chairs, desks, etc.) for the Center and for the WLC manager's office.

(2) The SCHOOL will select two teachers from its staff to work in the Learning Center, and the SCHOOL agrees that WLC will have an opportunity to participate in and approve of their selection. The SCHOOL will arrange for the teachers selected to be available for training at least two weeks before the start of the school year.

3. Operations

A. WLC will operate the PROGRAM in the Center according to these terms and standards:

(1) The PROGRAM will be ready to enroll students not later than 28 September 1970. The Center will be open and the PROGRAM will be available

for students for no fewer than 5 hours a day, 5 days each week during the school year. Additional hours of operation at any time, and reduced or adjusted hours of operation during school holiday or vacation periods will be arranged by agreement between WLC and the SCHOOL.

(2) WLC will accept for enrollment in the PROGRAM all students assigned to it by the SCHOOL. Based on test information provided for each student by the SCHOOL WLC will establish a learning objective and a program of study for each student. Each student's schedule of attendance at the Center will be arranged as far as possible so that he may be expected to accomplish his objective on schedule.

(3) WLC may notify the SCHOOL within the first 20 hours of any student's attendance at the Learning Center that in its judgment the student cannot benefit from the PROGRAM, and in such case, after review, the student will be withdrawn from the PROGRAM. WLC expects that not more than 3% of the students will fall in this category. Any student who is withdrawn from the PROGRAM may be re-enrolled after the factors responsible for his withdrawal have been remedied.

(4) The results of the PROGRAM will be measured by the achievement of students enrolled in it. The unit of achievement is one achievement-year, which is equal to a 1.0 gain in grade level as determined by standardized tests. WLC's performance goal, which is subject to the enrollment and attendance standards established in paragraph 3B(2) below, is that students enrolled in the PROGRAM will accomplish a total of 400 achievement-years.

(5) WLC will arrange, in cooperation with the SCHOOL, for visitors, observers, orientation sessions, teachers workshops, and other activities relating to the operation of the PROGRAM provided only that such activities are judged not to interfere with its effective operation.

(6) WLC will arrange with the SCHOOL to provide it

with appropriate information on the progress of each student enrolled in the PROGRAM.

B. To assist with and support the operation of the PROGRAM, the SCHOOL will do these things:

(1) The SCHOOL will select Title I participant students for enrollment in the PROGRAM during regular school hours, based on their needs for remedial instruction in mathematics and reading. Each student assigned will have an objective of achieving not less than 1.0 achievement-years in reading and math.

(2) The SCHOOL will pre-test each student assigned to the PROGRAM in math and/or reading to establish his entry level. Only nationally standardized tests which report in grade level equivalents will be used for pre-testing. The SCHOOL will administer post-tests to each student within ten school days of being notified by WLC that the student has completed his work. The post-tests will be alternate forms of the pre-tests, and the results of the pre- and post-tests will be compared to determine a student's progress in a subject measured in achievement-years.

(3) The SCHOOL will be responsible for the enrollment and attendance of students in the PROGRAM at standard levels which will reasonably permit them to accomplish the PROGRAM'S performance goal of 400 achievement-years. To this end, the SCHOOL will:

(a) Enroll students for a total of not less than 355 achievement-years in the Learning Center, and

(b) Arrange for 103 Title I students to attend the Learning Center for 2-1/2 hours every school day. This is the equivalent of 258 student-hours per day.

(c) Assure WLC of a "standard minimum attendance" in the Learning Center of at least 220 student hours on not less than 170 school days during the school year. This means that the "standard minimum attend-

ance" in the Center will be 220 student-hours per day, and that the "standard minimum school year" will be 170 days.

4. Payment

A. The SCHOOL will pay WLC for its success in accomplishing the performance goals of the PROGRAM, and for the achievements of the students enrolled in it. The total payment to be made will be determined according to the following terms and conditions:

(1) The standard price for an achievement-year accomplished under this contract is $168.75, and the SCHOOL will pay WLC that price for each achievement-year accomplished by students enrolled in the PROGRAM, if the average time to accomplish an achievement-year in each subject for all students is 90 hours, or less.

(2) If all students in the PROGRAM average more than 90 hours per achievement-year per subject, the price of $168.75 will be reduced proportionately. For example, an average of 99 hours represents a 10% greater time, and would result in a price for all achievement-years of $151.87 (90% of ($168.75).

(3) If any student fails to accomplish at least a 1.0 achievement-year in a subject in 120 hours, the SCHOOL will pay nothing to WLC for that student's work in that subject. The student will remain in the PROGRAM, and his new pre-test score will be the score he obtained on his 120-hour test.

(4) If a student is enrolled with the objective of accomplishing more than a 1.0 achievement-year in a subject, his actual achievement, measured to the nearest 10th of an achievement-year, will be credited to the PROGRAM, and the equivalent fraction of the price for an achievement-year will be paid to WLC. However, the SCHOOL will in no case pay for more achievement than was established as the student's objective when he enrolled. All achievement beyond that objective by any student will be at no cost to the SCHOOL.

(5) When the SCHOOL has enrolled students for achievement-years having a value of $60,000 (about 355 achievement-years), the SCHOOL may elect to enroll no further students, in which case it will owe no further payment to WLC. If the SCHOOL elects to enroll students in the PROGRAM for more than a total value of $60,000, WLC will accept them for enrollment (provided only that there is reasonable time for them to accomplish the objective for which they are enrolled) at the price of $168.75 per achievement-year until 400 achievement-years are accomplished, and at the price of $75 per achievement-year for all additional enrollments to be completed through August 31, 1971.

(6) If the attendance at the Learning Center on any of the 170 days in the "standard minimum school year" is less than the "standard minimum attendance" of 220 student-hours per day, then the number of student-hours by which the attendance is less than 220 shall be considered excessive absence. Each hour of excessive absence will be considered equal to 1/90th of an achievement-year. The total number of hours of excessive absences during the year, divided by 90, will be counted as achievement-years completed, and the price for that number of achievement-years will be payable to WLC. Any hours of attendance by a student that total less than 50 in a subject, and all hours of attendance by a student for which no pre-test/post-test measurements are available will be considered hours of excessive absence for the purposes of this paragraph. WLC will cooperate with the SCHOOL in scheduling additional hours of operation of the Learning Centers to permit students to make up excessive absences and in this way to minimize the effects of this paragraph.

(7) The SCHOOL will make monthly partial progress payments to WLC on terms to be arranged.

5. It is understood that WLC will not be liable for loss, damage, detention, or delay resulting from causes beyond its reasonable control.

6. WLC will use its best efforts to perform this Agreement in a reasonably diligent manner. There are no warranties, express or implied, except as set forth in this Agreement; and the results of the Learning Center system are guaranteed specifically as described herein and in no other way. In no event shall WLC be liable for any consequential or incidental damage arising out of this Agreement or the breach thereof.

7. This Agreement is not assignable by either party without the prior written consent of the other party.

8. All notices given in connection with this Agreement shall be given in writing. If to WLC, addressed to Westinghouse Learning Corporation, 100 Park Avenue, New York, New York 10017, Attention: H. K. Skeele, Vice President, and if to SCHOOL, addressed to Superintendent, Gilroy Unified School District, 7663 Church Street, Gilroy, California 95020.

IN WITNESS WHEREOF the parties have hereunto set their hands on the date first above written.

GILROY PUBLIC SCHOOLS	WESTINGHOUSE LEARNING CORPORATION
BY:	BY:
(S. Robert Infelise)	(H. K. Skeele)
Superintendent	Vice President